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Forest Research Notes

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SWEETGUM BLIGHT AND DIEBACK OF ASSOCIATED HARDWOODS ON THE BELTSVILLE EXPERIMENTAL FOREST IN MARYLAND

In 1948, a dieback of sweetgum (Liquidambar styraciflua L.) was first observed and reported at College Park, Md.[1] Since then, surveys made from Maryland southward have shown that the dieback, now termed sweetgum blight, has increased in both distribution and severity and now occurs throughout much of the species' range. No pathogenic organism has been found to be associated with this blight.

At the Beltsville Experimental Forest, which is less than 10 miles from College Park, a detailed evaluation of this disease was made in July 1959 on a 33-acre compartment. All sweetgums and other principal hardwoods, predominately oaks, were examined for crown dieback. A classification of affected crowns developed by Toole[2] was used. It is as follows:

Crown dieback index value	Portion of crown affected
0	None
1	Up to 1/8
4	1/8 to 1/2
8	Over half
10	Dead trees

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This inventory was based on forest types. When the data were summarized, two facts stood out: (1) Nearly half the sweetgums, all of which were growing on sites unaffected

[1] Miller, P. R., and O'Brien, M. J. An apparently new sweetgum disease in Maryland. U.S. Dept. Agr. Plant Dis. Rptr. 35: 295-297, 1948.

[2] Toole, E. Richard, and Broadfoot, W. M. Sweetgum blight as related to alluvial soils of the Mississippi flood plain. Forest Sci. 5: 2-9, illus. 1959.

by influences such as highways, drainage ditches, habitations, and similar disturbances, exhibited typical blight symptoms. (2) Relatively few of the associated hardwoods showed crown deficiencies--in fact, more than 90 percent of them had sound, healthy crowns.

The three forest types on which the inventory and dieback tally was based were pine, pine-hardwood, and mixed hardwoods. The areas of these were 12.7, 12.9, and 7.2 acres respectively. Within these types the proportion of sweetgum trees affected with blight was: pine type, 56 percent; pine-hardwoods, 53 percent; and mixed hardwoods, 37 percent. In all, 517 sweetgums, ranging from 5 to 21 inches d.b.h.,were examined, of which 48.4 percent were affected.

This compared very unfavorably with the associated hardwoods. Out of 2,102 hardwood trees examined (red or white oaks, and a few maples and black gums), less than 8 percent were classed as showing some form of top dieback (fig. 1). Further, it is not believed this condition was necessarily pathogenic in these species; more likely it was

Figure 1.--*A white oak showing typical crown dieback. This tree was assigned a crown index value of 4.*

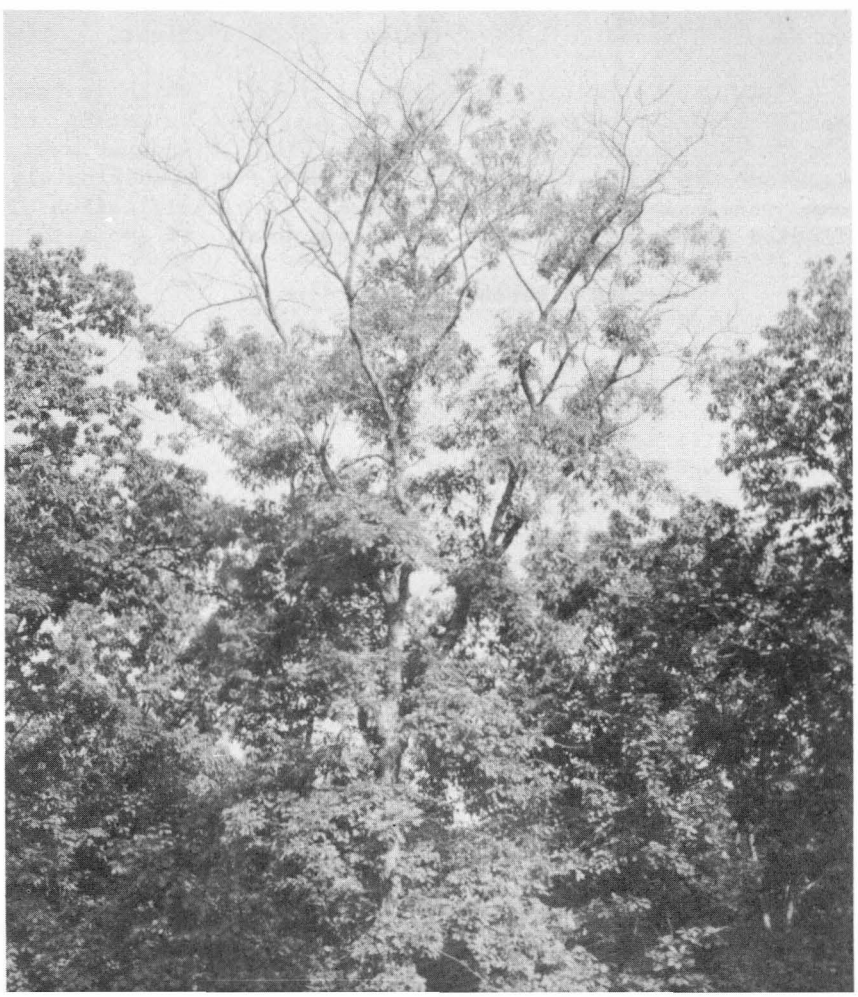

Figure 2.--*A group of pole-size sweetgums showing advanced blight symptoms. A few larger healthy gums are visible.*

simply a manifestation of overmaturity, decadence, or suppression. In contrast, the affected sweetgums exhibited the typical blight characteristics (fig. 2) described by others.[3]

Figure 3 portrays the distribution of tree crown conditions for species, by index values and by forest types. From this it is very evident that the frequency of crown deterioration in sweetgum greatly exceeds that in the other hardwoods. In fact, the prevalence of this condition is 6 times greater in the sweetgum--48 percent compared to 8 percent when all trees are considered.

On the other hand, figure 3 shows some indication that, as dieback severity increases, the number of sweetgums affected tends to decrease. The reverse is generally true of the other hardwoods.

In 1954, a survey covering all the Atlantic and Gulf Coast States from Delaware to Louisiana was made by Hepting.[4] The condition of the crowns of sweetgums and associated

[3]Miller, P. R., and Gravatt, G. F. The sweetgum blight. U. S. Dept. Agr. Plant Dis. Rptr. 36: 247-252, 1952.

[4]Hepting, G. H. A southwide survey of sweetgum blight. U. S. Dept. Agr. Plant Dis. Rptr. 39: 261-265, 1955.

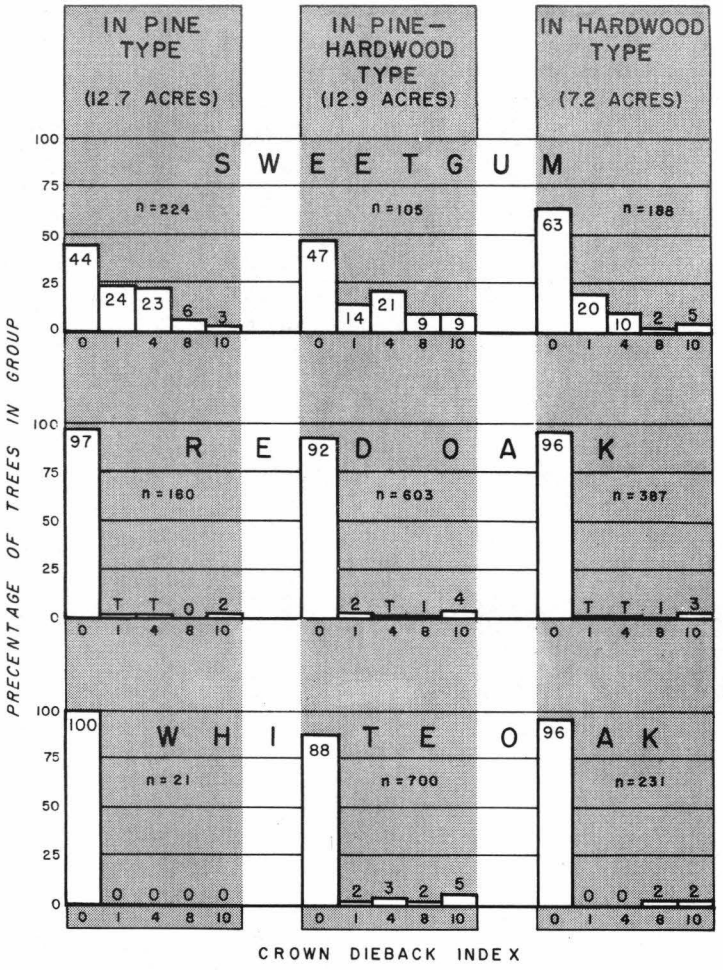

Figure 3.--*Distribution of crown-dieback classes within forest-type groups.*

hardwoods was recorded by classes regardless of possible causes of the condition. His findings were not unlike those reported in this paper. About one-third of all sweetgums examined were affected with some degree of dieback; and in the white and red oak groups combined, approximately 12 percent showed crown deficiencies.

These observations indicate that sweetgum blight--whatever causes it--is potentially a serious threat to the sweetgums in southern forests.

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